

# **COURSE OVERVIEW**

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- **Introduction**
- **Costs And Cost Analysis**
- **Cost Or Pricing Data**
- **Allowability**
- **Data Collection**
- **Work Design And Analysis**
- **Estimating / Analysis Techniques**
- **Direct Material Costs**
- **Direct Labor Costs**
- **Other Direct Costs**
- **Indirect Costs**
- **Profit Or Fee**
- **Preparing For Negotiation**
- **Cost Realism Analysis**

# **DEFINITIONS OF PRICE**

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**P. I-2**

- The amount of money that a buyer pays a seller for the delivery of a product or the performance of a service
- Cost plus any fee or profit applicable to the contract type

# **SELLER'S PRICING STRATEGIES P. I-4**

- **Cost-Based**
- **Market-Based**

## **DEPENDING ON THEIR PRICING STRATEGIES, OFFERORS MAY:**

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**P. I-4**

- Aim High
- Aim Low
- Aim For Dead Center

# GOVERNMENT'S PRICING OBJECTIVES

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P. I-5

- Purchase supplies and services from responsible sources at fair and reasonable prices
- Price each contract separately and independently
- **Exclude** any contingency for which the contract adjusts the price upon occurrence

- A price in line with market value, OR
- A price in line with most probable cost, assuming performance by a well managed responsible firm using reasonably efficient and economical methods

## **FAIR TO THE SELLER?**

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**P. I-7**

A price that is realistic in terms of seller ability to satisfy terms and conditions

# **REASONABLE?**

**P. I-9**

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A price that a prudent and competent buyer would pay,  
given adequate data on:

- Market conditions,
- Alternatives,
- The evaluated price of each alternative, and
- Non-price evaluation factors

# PRICE CONTRACTS INDEPENDENTLY

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P. I-12

- Do **not** consider reductions in other contracts
- Do **not** consider loses or profit on other contracts

# **TYPES OF CONTINGENCIES**

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**P. I-13**

1. Those for which the cost impact **CAN** be reasonably estimated (consider these)
  
1. Those for which the cost impact **CANNOT** be reasonably estimated (ignore these)

## **PARTICIPANTS IN COST ANALYSIS. I-16**

- Contracting Officer
- Requirements / Program / Project Manager
- User
- Technical Specialists
- Auditors And Other Financial Specialists
- Administrative Contracting Officers
- Lawyers

# **TOTAL COST OF A CONTRACT**

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**P. 1-6**

“The sum of all allowable direct and indirect costs allocable to the contract, incurred or to be incurred, less any allocable credits, plus any applicable cost of money.”

“The process of examining and evaluating a proposed price to determine if it is fair and reasonable without evaluating separate elements of cost and proposed profit.”

Comparing *proposed prices* to:

- Prices from other offerors
- Commercial prices
- Prior prices for the same or similar items
- Rough yardsticks (e.g., price per pound)
- Independent Government Cost Estimates

“Review and evaluation of the separate cost elements and proposed profit ... to form an opinion on the degree to which the proposed costs represent what the cost of the contract should be, assuming reasonable economy and efficiency.”

# **COST ANALYSIS IS *MANDATORY* WHEN P. 1-12**

Certified cost or pricing data are required

**AND**

No exemption applies

## **YOU MAY ALSO NEED TO ANALYZE COSTS P. 1-12**

If you **cannot** determine that a price is fair and reasonable through price analysis alone.

- Round-Table
- Comparison
- Detailed Analysis

- Accuracy
- Consistency
- Speed Of Development
- Development Cost
- Data Required

## **COST OR PRICING DATA ARE...**

**P. 2-5**

Facts that prudent buyers and sellers would expect to have an impact on price.

## **CONTRACTING OFFICER DETERMINATIONS P. 2-5**

- Are data required?
- Is data certification required?
- Extent of data required?
- What form of data submission is required?

Contractor official certifies that the data submitted as of agreement on price are:

- ACCURATE
- CURRENT
- COMPLETE

# WHEN IS A CERTIFICATE REQUIRED?

P. 2-8

Type Of Contract Action	\$25,000 Or Less	More Than \$25,000, But Not More Than \$100,000 (\$500,000 In DoD)	More Than \$100,000 (\$500,000 In DoD)
New contract price proposal	Never	Only if the contracting officer determines in writing that pricing decision CANNOT be made based on price analysis alone	YES, unless proposal can be exempted based on: <ul style="list-style-type: none"><li>• Adequate price competition</li><li>• Catalog pricing</li><li>• Market pricing, or</li><li>• Regulated pricing</li></ul>

# **CATALOG PRICING EXEMPTION**

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**P. 2-13**

- Prices based on established catalog prices
- Items are commercially available
- Items are sold in substantial quantities to the general public

## SECTION I - CATALOG PRICE

7. CATALOG IDENTIFICATION AND DATE		8. SALES PERIOD COVERED	
		FROM	TO
9. CATEGORIES OF SALES	TOTAL UNITS SOLD*	10. REMARKS	
<b>A.</b> U.S. Government sales			
<b>B.</b> Sales at catalog price to general public			
<b>C.</b> Other sales to general public			

# **NORMALLY DENY REQUESTS FOR CATALOG EXEMPTIONS WHEN**

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**P. 2-14**

Sales to the General Public (B+C) are less than  
35% of all sales (A+B+C)

**OR**

Sales at catalog price (B) are less than  
55% of sales to the General Public (B+C)

# **NORMALLY APPROVE REQUESTS FOR CATALOG EXEMPTIONS WHEN**

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**P. 2-14**

Sales to the General Public (B+C) are at least  
55% of all sales (A+B+C)

**AND**

Sales at catalog price (B) are at least  
75% of sales to the General Public (B+C)

# **MARKET PRICING EXEMPTION**

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**P. 2-15**

- Prices are established in usual and ordinary course of trade between buyers and sellers free to bargain
- Price substantiated by independent sources
- Sufficient commercial buyers

# **REGULATED PRICING EXEMPTION**

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**P. 2-16**

- Price set by law or regulation
- Law or regulation applies
- Proposed price is current regulated price

<b>Proposal Summary 1— Line Item 1: 20,000 #12 pins</b>			
Cost Elements	Proposed Contract Estimate Total Cost	Proposed Contract Estimate Unit Cost	Reference
Materials	\$40,000	\$2.00	A
Direct Labor	\$40,000	\$2.00	B
Indirect Costs	\$80,000	\$4.00	C
Other Costs	\$10,000	\$0.50	D
Total	\$170,000	\$8.50	

<b>Proposal Summary 2— Line Item 2: 8,000 #14 pins</b>			
Cost Elements	Proposed Contract Estimate—Total Cost	Proposed Contract Estimate—Unit Cost	Reference
Materials	\$32,000	\$4.00	E
Direct Labor	\$16,000	\$2.00	F
Indirect Costs	\$32,000	\$4.00	G
Other Costs	\$4,000	\$0.50	H
Total	\$84,000	\$10.50	

## **SUMMARY TOTALS ALL LINE ITEMS**

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**P. 2-21**

Materials	\$72,000
Direct Labor	\$56,000
Indirect	\$112,000
Other	\$14,000
Total:	\$254,000

8. List and reference the identification, quantity, and total price proposed for each contract line item. A line item cost breakdown supporting this recap is required unless otherwise specified by the Contracting Officer.

A. LINE ITEM NO.	B. IDENTIFI- CATION	C. QUANTITY	D. TOTAL PRICE	E. REFERENCE
1	#12 pins	20,000	\$170,000	Proposal Summary 1
2	#14 pins	8,000	\$84,000	Proposal Summary 2

## **CERTIFICATE OF CURRENT COST OR PRICING DATA P. 2-28**

This is to certify that, to the best of my knowledge and belief, the cost or pricing data ... submitted, either actually or by specific identification in writing, to the contracting officer or to the contracting officer's representative in support of \_\_\_\_\_\* are accurate, complete, and current as of \_\_\_\_\_\*\*. ...

Firm \_\_\_\_\_  
Signature \_\_\_\_\_  
Name \_\_\_\_\_  
Title \_\_\_\_\_  
Date of execution\*\*\* \_\_\_\_\_

\*Identify the proposal ... involved, giving the appropriate identifying number (e.g. RFP No.).

\*\*Insert the day, month, and year when price negotiations were concluded and price agreement was reached.

\*\*\*Insert the day, month, and year of signing, which should be as close as practicable to the date when the price negotiations were concluded and the contract price was agreed to.

## **DEFECTIVE PRICING REDUCTION**

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**P. 2-29**

Contract clauses provide for price reduction for any significant price increase because cost or pricing data were **not** current, accurate, and complete.

# **THE GOVERNMENT'S PRENEGOTIATION OBJECTIVE**

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**P. 3-6**

“Profit or fee ... and the Government’s estimate of allowable costs to be incurred in contract performance together equal the Government’s total prenegotiation objective.”

# **A COST IS ALLOWABLE IF IT IS**

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**P. 3-6**

- Reasonable
- Fairly allocated
- Properly accounted for
- Not ruled out by specific cost principles in FAR Part 31
- Not ruled out by other contract terms

# **TO BE CONSIDERED REASONABLE, THE COST MUST BE**

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**P. 3-7**

- Generally recognized as ordinary and necessary in conducting business
- Consistent with generally accepted sound business practices, and with applicable laws and regulations
- In keeping with the firm's responsibilities to the Government, other customers, owners, employees, and the public
- Consistent with the firm's established business practices

# **ALLOCATING A PROPOSED COST**

**P. 3-10**

<b>IF:</b>	<b>THE OFFEROR SHOULD ORDINARILY PROPOSE:</b>
The cost would be incurred for work on your contract, and your contract alone	Charging the entire cost to your contract
The cost would benefit both your work and work for other customers	Dividing the cost among those customers, in reasonable proportion to benefits received.
The cost is necessary for over-all operation of the business.	Dividing the cost among all customers of the firm, in proportion to each customer's expected share of the firm's projected business volume.

# ACCOUNTING PRACTICES AND STANDARDS

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P. 3-12

- COST ACCOUNTING STANDARDS (CAS)
- GENERALLY ACCEPTED ACCOUNTING PRINCIPLES (GAAP)
- FAR PROVISIONS

# **SPECIFIC COST PRINCIPLES**

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**P. 3-19**

- ALLOWABLE COSTS
- UNALLOWABLE COSTS
- ALLOWABLE WITH RESTRICTIONS

- CAN RULE OUT ADDITIONAL COSTS
- **CANNOT** BE LESS RESTRICTIVE

# **WHERE TO FIND CONTRACT FILES**

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**P. 4-5**

- Your contracting activity
- Other contracting activities
- Contract administration activities of your agency
- Defense contract administration activities

## **WHAT TO LOOK FOR IN THESE FILES** **P. 4-5**

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- Contract Specifications And Statements Of Work
- Program/Procurement History
- Prior Audits And Technical Reviews
- Contractor Systems Reviews
- Proposals And Price Negotiation Memoranda  
From Prior Negotiations

# **REVIEW**

## **P. 4-6 Through 4-16**

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- The RFP
- The history of the deliverable
- The contractor's past dealings with the Government

## **MARKET RESEARCH DATA SOURCES    P. 4-17**

- Computerized Databases
- Manual Item Records
- Catalogs
- Economic Indexes
- Trade Journals
- Product Brochures
- Federal Supply Schedules

# **SOURCES OF TECHNICAL SUPPORT**

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**P. 4-19**

- IN-HOUSE SUPPORT
- CONTRACT ADMINISTRATION SUPPORT

## **ASK TECHNICAL REVIEWERS TO EVALUATE: P. 4-19**

- **Quantities And Kinds Of Material**
- **Number Of Labor Hours**
- **Labor Skill Mix**
- **Special Tooling, Test Equipment, And Facilities**
- **Scrap And Spoilage Factors**
- **Work Design, Procedures And Processes**
- **Shop Loading Vs. Delivery Schedules**
- **Make-Or-Buy Decisions**
- **Trends In Production Efficiency**
- **Offeror Technical Track Record**

- State extent of support needed
- Identify areas where input is required
- Include information needed for review
- Assign realistic deadline

# **REVIEWING THE TECHNICAL REPORT**

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**P. 4-21**

- Does it answer the questions in your request?
- Do you understand the answers?
- Does the report support its conclusions?
- Are there any discrepancies with other evaluations?

- Dollar value of offer
- Lack of knowledge of contractor
- Sensitive conditions
- Data in hand not sufficient to determine the reasonableness of proposed costs

- State extent of support needed
- Identify areas where input is required
- Include information needed for review
- Assign realistic deadline

- Complete Detailed Audit Including Technical
- Complete Detailed Audit Of Selected Elements
- Audit Of Labor And Overhead Rates
- Desk Audit
- Desk Audit Supplemented With Selected Detailed Analysis

- Does it address the areas you specified?
- Do you understand its recommendations?
- Does the report support its recommendations?
- Are there any discrepancies with other evaluations?

# **BASIC PLANNING ASSUMPTIONS**

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**P. 5-6**

- Future will be the **same** as the past
- Future will be **different** from the past

# **TYPICAL PLANNING ASSUMPTIONS**

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**P. 5-8**

- Anticipated problems
- Anticipated technological change
- Unavoidable interruptions and shortages
- Inflation

# CONTINGENCY CATEGORIES

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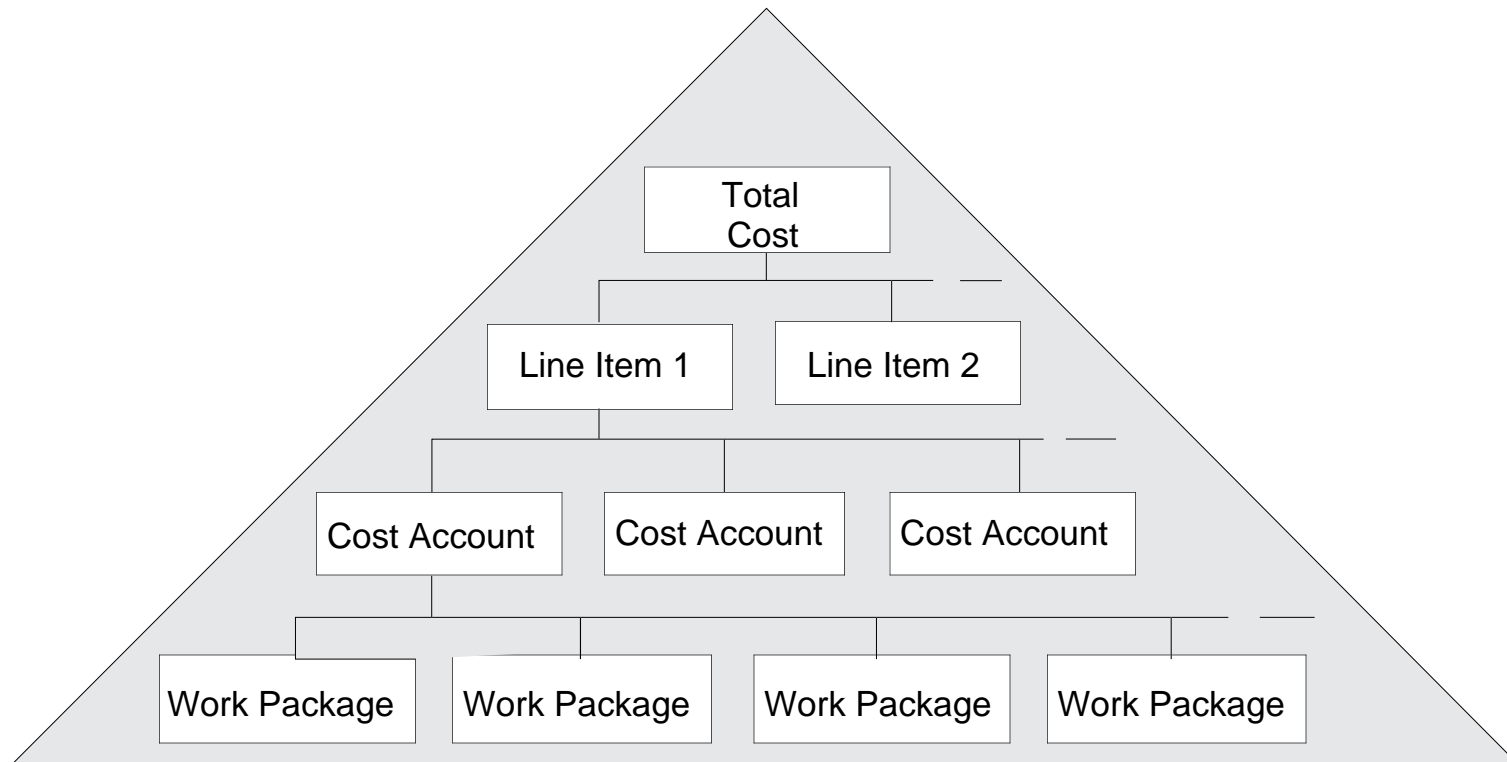
P. 5-13

- Able to be reasonably forecasted
- **Not** able to be reasonably forecasted
- Added to historical cost

# STRUCTURED BREAKDOWN

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P. 5-15



Cost Analysis 5-4

## AREAS FOR IMPROVEMENT:

- Tasks and subtasks
- Methods
- Facilities
- Equipment
- Hardware and software
- Management and operating systems
- Other aspects of performance

# **SOURCES OF COST RISK**

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**P. 5-26**

- Investment Risk
- Performance Risk
- Economic Risk

## **EVALUATE OFFEROR'S RISK ASSESSMENT P. 5-29**

- What information is available to offeror?
- Is the offeror's assessment realistic? What can the offeror do to control or reduce the risk.
- Can the risk be mitigated by alternative terms?

# **SOME COMMON CONTRACT TYPES**

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**P. 5-32**

- Firm Fixed-Price (FFP)
- Fixed-Price Economic Price Adjustment (FP-EPA)
- Cost-Plus-Fixed-Fee (CPFF), Award Fee (CPAF),  
Or Incentive-Fee (CPIF)

- Impossible specifications
- Conflicting specifications
- Specifications open to interpretation

## **BASE YOUR COST ANALYSIS ON:**

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**P. 5-42**

- Realistic Planning Assumptions
- Should-Cost Principles
- Realistic Assessment Of Risk

- Sampling
- Index Numbers
- Cost-Volume-Profit Analysis
- Line-Of-Best-Fit Projections
- Cost Estimating Relationships
- Moving Averages
- Improvement Curves

- Large amount of data
- No time to evaluate every item

# **STRATIFIED SAMPLING**

**P. 6-6**

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1. Identify items that merit 100% analysis
2. Group remaining items
3. Determine number of items to sample
4. Randomly select the items
5. Develop a “decrement” from the sampled items
6. Apply the decrement to the total proposed cost of all items
7. Total prenegotiation positions from each group

Cost Analysis 6-3

- Inflate / deflate historical costs for comparison with proposed costs
- Estimate inflation / deflation over contract period

# INDEX CONSTRUCTION STEPS

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P. 6-12

STEP	ACTION
1	Collect data
2	Select a base period
3	Divide each period price by the base period price
4	Multiply by 100

Cost Analysis 6-5

# INDEX CONSTRUCTION EXAMPLE

P. 6-13

YEAR	YEARLY AVERAGE PRICE	DIVIDED BY BASE 1987 PRICE	* 100 =			INDEX NUMBER
1987	\$84.12	÷ \$84.12	= 1.000	* 100	=	100.0
1988	\$90.84	÷ \$84.12	= 1.080	* 100	=	108.0
1989	\$95.06	÷ \$84.12	= 1.130	* 100	=	113.0
1990	\$101.97	÷ \$84.12	= 1.212	* 100	=	121.2
1991	\$107.32	÷ \$84.12	= 1.276	* 100	=	127.6

Cost Analysis 6-6

# **SOME SOURCES OF PRICE INDEXES**

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**P. 6-14**

- Producer Price Indexes
- Consumer Price Indexes
- Monthly Labor Review
- Agency Indexes
- Contracting Office Indexes

Cost Analysis 6-7

# PRICE ADJUSTMENT FORMULA

P. 6-18

**Formula:**

$$\frac{\text{INDEX FOR PERIOD } T_2}{\text{INDEX FOR PERIOD } T_1} * \text{KNOWN PRICE FROM PERIOD } T_1 = \text{PRICE ESTIMATE FOR PERIOD } T_2$$

**Example:**

$$\frac{\text{1991 Price Index}}{\text{1990 Price Index}} * \text{1990 Price} = \text{1991 PRICE ESTIMATE}$$

$$\frac{127.6}{121.2} * \$101.97 = \$107.35$$

Cost Analysis 6-8

# FINANCIAL FORECASTERS

CE 6-1

PERIOD	PERIOD PRICE	INDEX BASE 19X3
19X3	\$3,000	<i>100.0</i>
19X4	\$3,150	<i>105.0</i>
19X5	\$2,990	<i>99.7</i>
19X6	\$3,200	<i>106.7</i>
19X7	\$3,295	<i>109.8</i>
19X8	\$3,350	<i>111.7</i>

Cost Analysis 6-9

## ADJUSTING PRICES FOR FURTHER ANALYSIS P. 6-22

YEAR	MACHINERY & EQUIPMENT INDEX	INDEX NUMBERS ADJUSTMENT CALCULATION	HISTORICAL PRICES	ADJUSTED PRICES
1986	100.0	$\frac{120.0}{100.0}$	\$17,666.67	\$21,200
1987	103.2	$\frac{120.0}{103.3}$	\$18,077.50	\$21,000
1988	106.5	$\frac{120.0}{106.5}$	\$18,460.00	\$20,800
1989	111.4	$\frac{120.0}{111.4}$	\$19,123.67	\$20,600
1990	115.5	$\frac{120.0}{115.5}$	\$19,635.00	\$20,400
1991	120.0			

Cost Analysis 6-10

- Estimate the unit cost for any specified quantity
- Determine what the product should cost at different quantity breaks
- Measure impact of customer decisions on profits

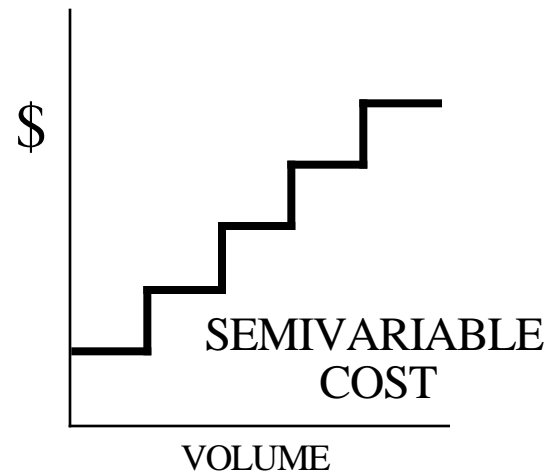
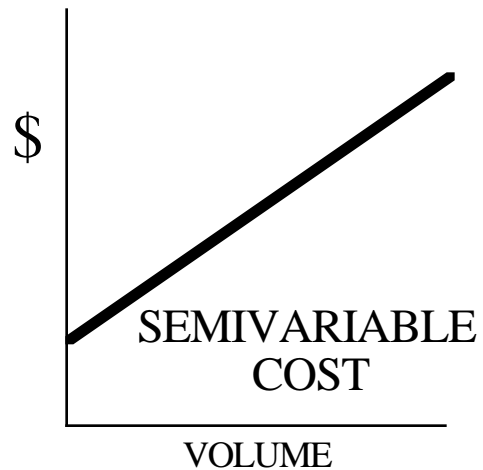
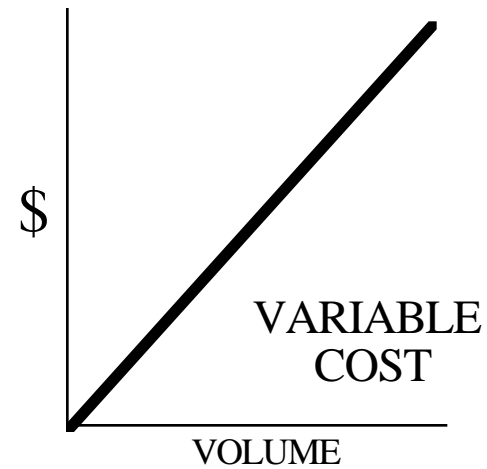
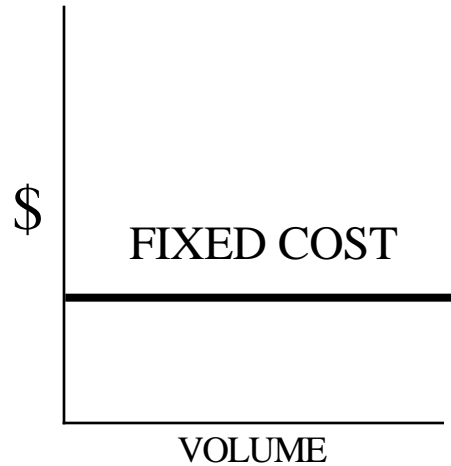
## **PRIOR SUBCONTRACTS FOR X TUBES    P. 6-26**

<i><b>Quantity</b></i>	<i><b>Unit Price</b></i>	<i><b>Total Price</b></i>
10,000	\$25	\$250,000
6,000	\$30	\$180,000
20,000	\$21	\$420,000

Cost Analysis 6-12

# COST-VOLUME RELATIONSHIPS

P.6-27



Cost Analysis 6-13

## **CALCULATING TOTAL COST**

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**P. 6-28**

$$TC = FC + (VC_U * Vol)$$

WHERE: TC = TOTAL COST

FC = FIXED COST

$VC_U$  = VARIABLE COST PER UNIT

VOL = VOLUME

## **CALCULATING VARIABLE COST**

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**P. 6-29**

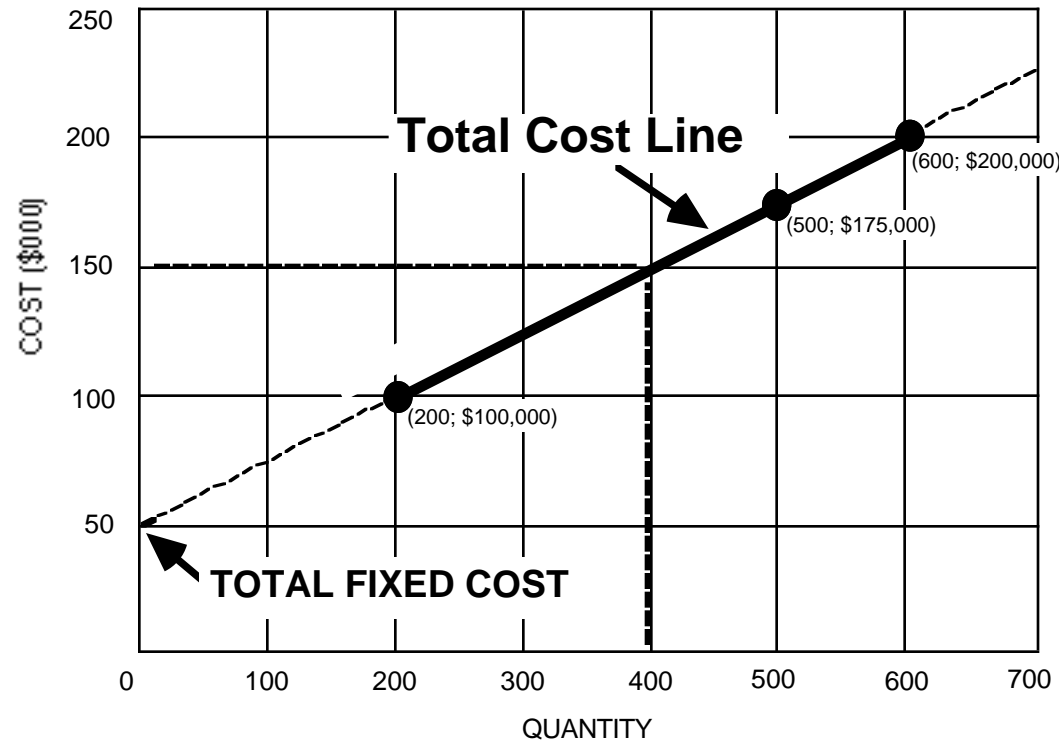
$$VC_U = \frac{\text{Change in Total Cost}}{\text{Change in Volume}}$$

$$VC_U = \frac{\text{Total Cost at Point 2} - \text{Total Cost at Point 1}}{\text{Volume at Point 2} - \text{Volume at Point 1}}$$

$$VC_U = \frac{TC_2 - TC_1}{Vol_2 - Vol_1}$$

# GRAPHIC RELATIONSHIP

P. 6-35



Cost Analysis 6-16

## **COST-VOLUME-PROFIT EQUATION**

**P. 6-36**

$$\text{REVENUE} = \text{COST} + \text{PROFIT}$$

$$SP_U * VOL = FC + (VC_U * Vol) + P$$

# **CONTRIBUTION INCOME**

**P. 6-38**

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CONTRIBUTION INCOME = REVENUE - VARIABLE COST

$$CI = (SP_U * Vol) - (VC_U * Vol)$$

$$CI = (SP_U - VC_U) * Vol$$

# **VISUALLY FITTING A LINE**

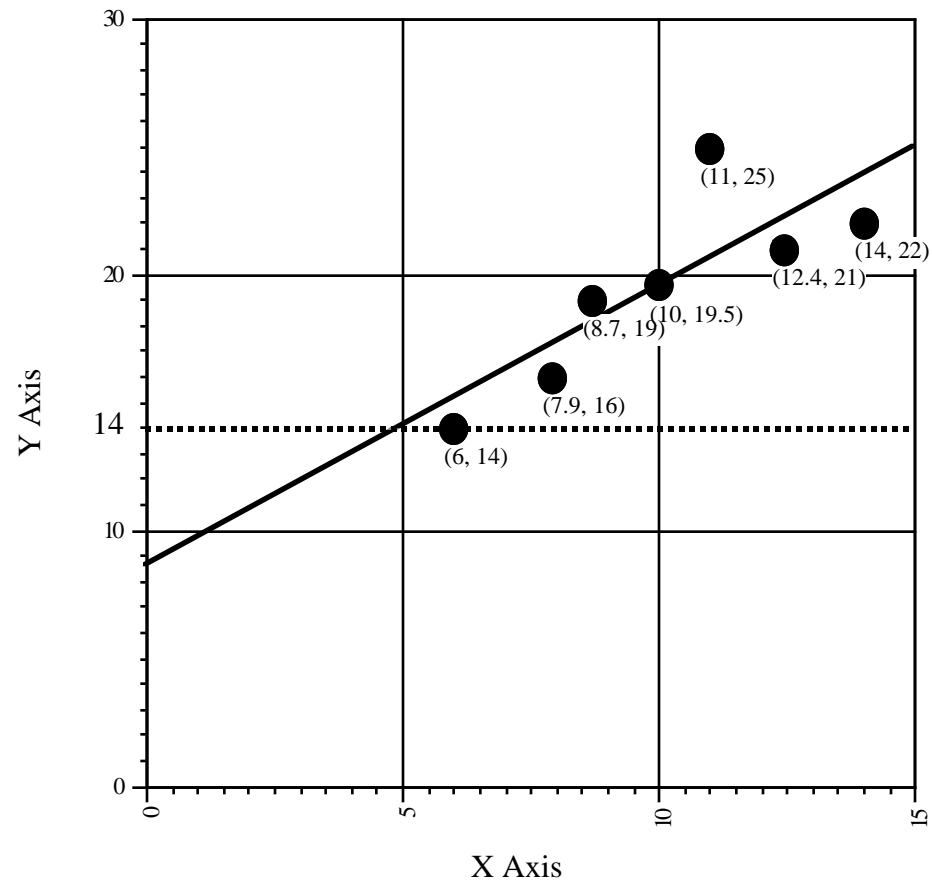
**P. 6-42**

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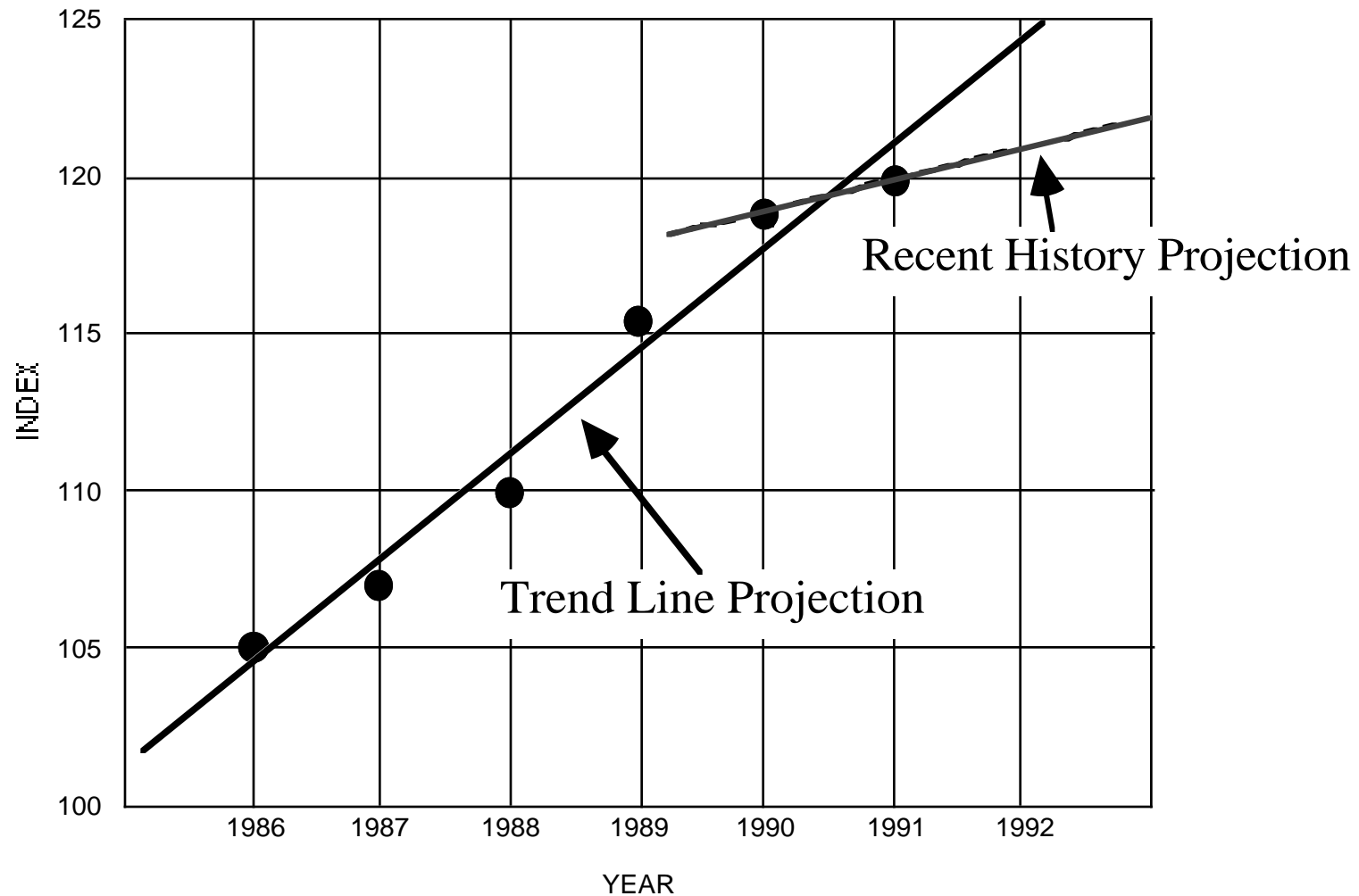
- Step 1. Graph the known data.
- Step 2. Find the point representing the average of the X values and the average of the Y values, (  $\bar{X}$  ,  $\bar{Y}$  ).
- Step 3. Draw a line through the (  $\bar{X}$  ,  $\bar{Y}$  ) and the data so that it minimizes the distance between the line and the data points.

# VISUALLY FITTING A LINE

P. 6-45



Cost Analysis 6-20



1. Designate the dependent variable (\$)
2. Select potential independent variables (cost drivers).
3. Collect data on the relationship between the dependent and independent variables.

4. Explore the relationship between the dependent and independent variables.
5. Select the relationship that best predicts the dependent variable (\$).
6. Document your findings.

# **MOVING AVERAGE DEVELOPMENT**

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**P. 6-69**

- Step 1      Collect historical data
- Step 2      Determine averaging period
- Step 3      Examine prediction accuracy

# MOVING AVERAGE DATA

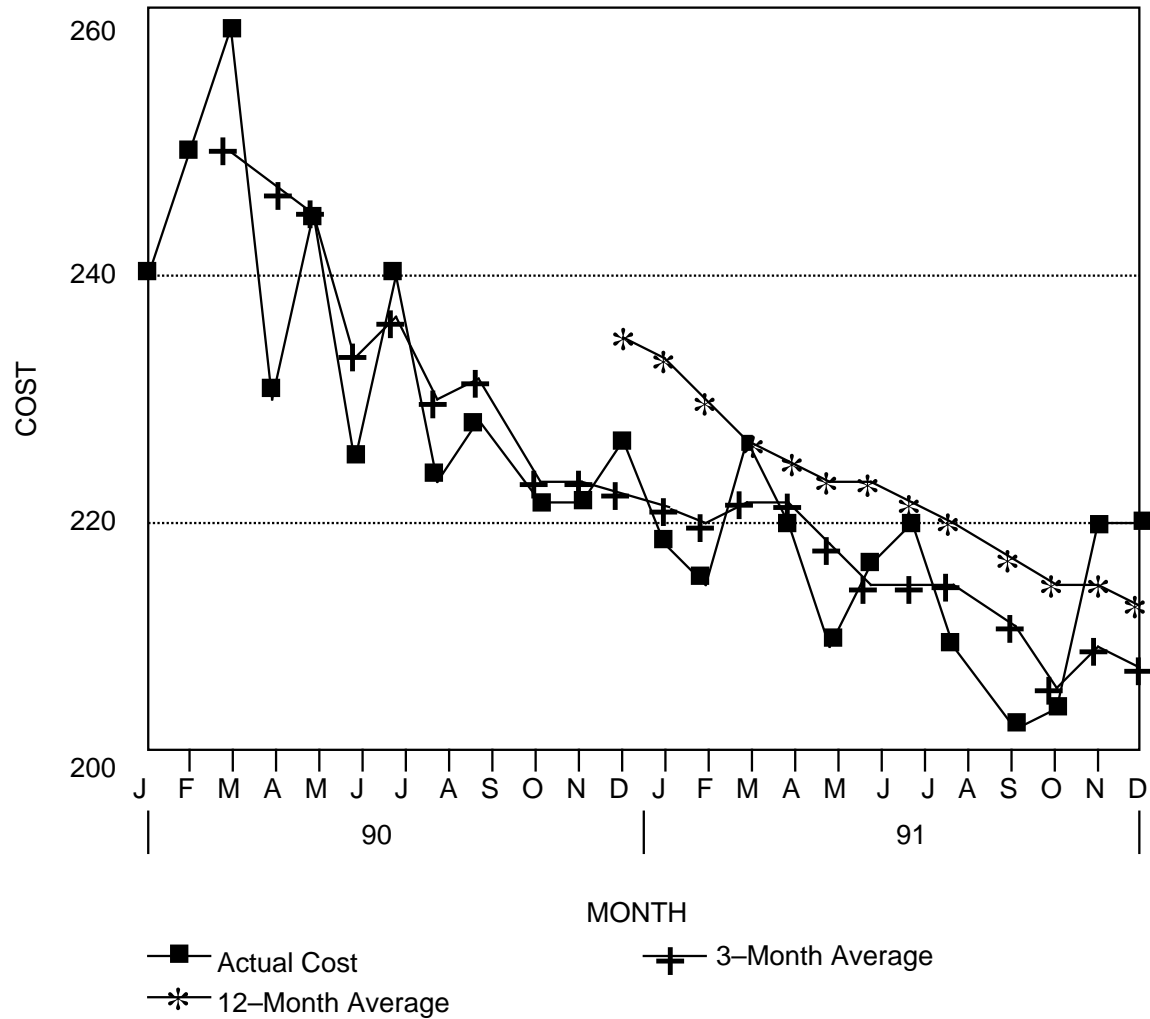
P. 6-70

Month	Cost	3-Month Average	12-Month Average
January 90	\$240		
February	250		
March	260	\$250	
April	230	247	
May	245	245	
June	225	233	
July	240	237	
August	224	230	
September	228	231	
October	223	225	
November	223	225	
December	227	224	\$235
January 91	218	223	233

Cost Analysis 6-25

# MOVING AVERAGE RESULTS

P. 6-71



Cost Analysis 6-26

# **IMPROVEMENT SITUATIONS**

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**P. 6-76**

- High proportion of manual labor
- Uninterrupted production
- Production of complex items
- No major technological change
- Continuous pressure to improve

# **IMPROVEMENT FACTORS**

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**P. 6-77**

- Job familiarization by workers
- Improved production procedures
- Improved tooling and tool coordination
- Improved work flow organization
- Improved product production
- Improved engineering support
- Improved parts support

“As the total volume of units produced **DOUBLES**, the cost per unit decreases by some constant percentage.”

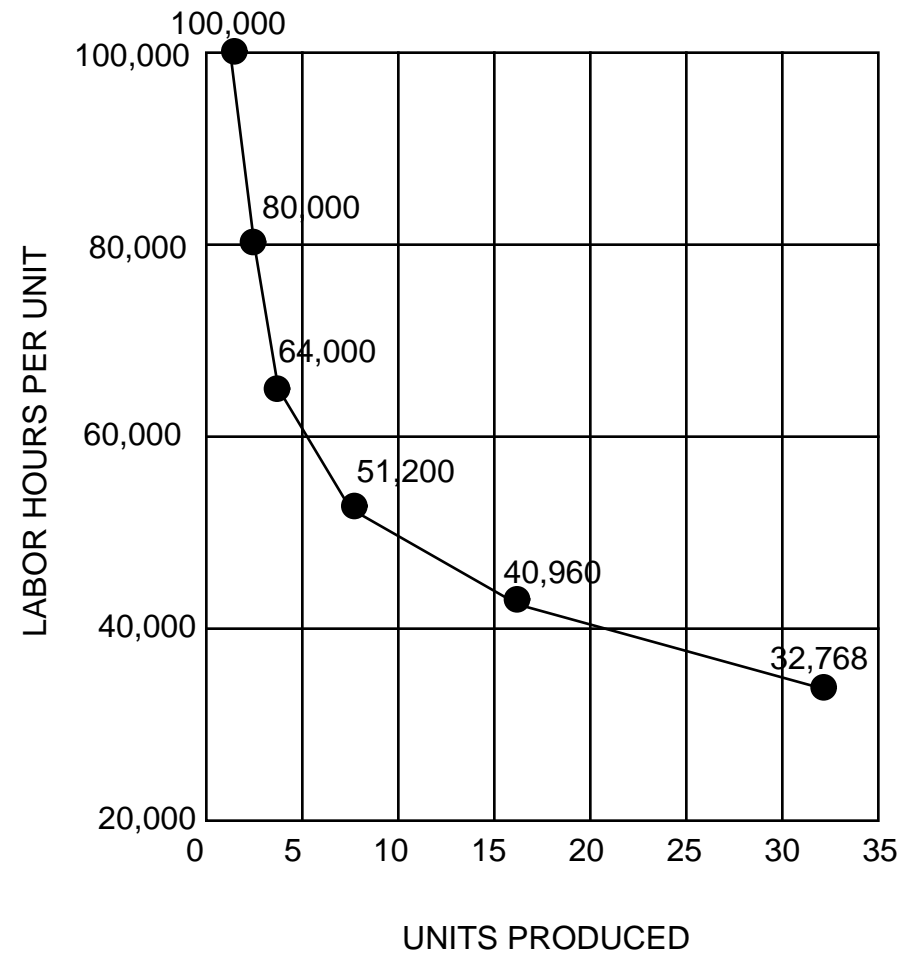
# UNIT CURVE EXAMPLE

P. 6-82

UNITS PRODUCED	LABOR HOURS PER UNIT AT DOUBLED QUANTITIES	DIFFERENCE IN LABOR HOURS PER UNIT AT DOUBLED QUANTITIES	RATE OF IMPROVEMENT (%)	SLOPE OF CURVE (%)
1	100,000			
2	80,000	20,000	20	80
4	64,000	16,000	20	80
8	51,200	12,800	20	80
16	40,960	10,240	20	80
32	32,768	8,192	20	80

# UNIT CURVE GRAPH

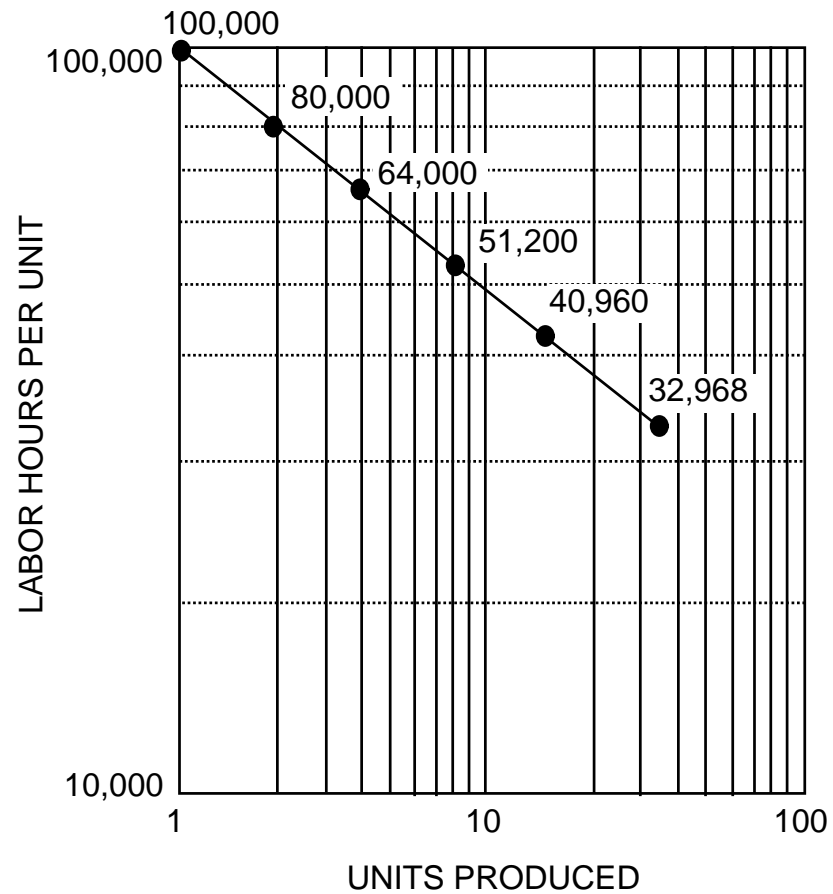
P. 6-83



Cost Analysis 6-31

# UNIT CURVE LOG-LOG GRAPH

P. 6-86



Cost Analysis 6-32

# **SLOPE SELECTION PRIORITY**

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**P. 6-88**

1. Same Item
2. Similar Items
3. General Product Category

- FIRST LOT ONLY:
  - LESS THAN 10, DIVIDE BY 2
  - 10 OR MORE, DIVIDE BY 3
  
- ALL OTHER LOTS
  - DIVIDE BY 2

## CALCULATIONS FOR THE LOT AVERAGE, UNIT COST AND THE LOT PLOT POINT P. 6-92

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LOT No.	LOT SIZE	CUMULATIV E UNITS	LOT MIDPOIN T	LOT PLOT POINT	LOT AVERAGE HOURS	LOT TOTAL HOURS
1	6	6	3.0	3.0	6,800	40,800
2	9	15	4.5	10.5	4,500	40,500
3	15	30	7.5	22.5	3,500	52,500
4	40	70	20.0	50.0		

# ATAG IMPROVEMENT

P. CE 6-27

LOT No.	LOT SIZE	CUMULATIVE UNITS	LOT MIDPOINT	LOT PLOT POINT	LOT AVERAGE HOURS	LOT TOTAL HOURS
1	8					2312
2	16					2672
3	26	50	13	37	120	3120
4	32					3040
5	80					

Cost Analysis 6-36

1. Question Proposed Material Mix
2. Question Summary Cost Estimates
3. Question Detailed Cost Estimates
4. Question Major Subcontract Requirements

## **IDENTIFY DIRECT MATERIAL ELEMENTS P. 7-6**

- Materials
- Inbound Transportation
- Intransit Insurance
- Scrap, Spoilage, & Defective Parts

## **ANALYZE DIRECT MATERIAL MIX P. 7-12**

- Determine if proposed units are necessary
- Determine if proposed material should be indirect
- Determine if proposed material mix is realistic
- Document concerns in prenegotiation positions

## **SUMMARY LEVEL ESTIMATE ANALYSIS P. 7-16**

- Determine if summary estimate is appropriate
- Determine what technique(s) used
- Determine if techniques were properly applied
- Develop and document prenegotiation positions

## **SUMMARY ESTIMATE ANALYSIS P. 7-19**

- New effort similar to historical effort?
- Changing value of dollar considered?
- Distortions in historical data identified?
- Changes in technology?
- Reasonable adjustments?
- Difference in material mix?
- Improvement curve theory properly considered in estimate?

## **DETAILED MATERIAL COST ESTIMATES P. 7-23**

- Quantity (base amount + scrap)
- Unit Price

- Consider material mix concerns
- Select sampling strategy
- Validate base estimates of quantities
- Validate adjustments to base estimates of quantities
- Document concerns and consider appropriately

# SCRAP RATE CALCULATION

---

P. 7-27

$$\frac{\text{Scrap Dollars}}{\text{Total Assembly Material Dollars}} \quad \text{or} \quad \frac{\text{Scrap Units}}{\text{Total Assembly Material Units}}$$

$$\frac{\text{Scrap Dollars}}{\text{Material Dollars Purchased}} \quad \text{or} \quad \frac{\text{Scrap Units}}{\text{Material Units Purchased}}$$

- Rate application consistent with calculation?
- Rate consistent with past experience?
- Similar materials, tolerances, and processes?
- Rate changing over time?

(continued next slide)

## **SCRAP RATE ANALYSIS (CONT.)**

---

**P. 7-28**

- Rate consistent with should-cost efficiency and effectiveness?
- Types of cost included consistently?
- Scrap value being considered?

## **ANALYZE UNIT PRICE ESTIMATESP. 7-29**

- Current Quotes
- Historical Quotes Or Purchase Prices
- Inventory Prices

## **ANALYZING CURRENT QUOTES P. 7-30**

- Quotes for required quantities?
- Prime likely to negotiate cuts in quoted prices?
- Do subcontract terms provide for discounts?
- When will subcontract negotiations take place?

(continued next slide)

## **ANALYZING CURRENT QUOTES (CONT.) P. 7-30**

- Are the items already in prime's inventory?
- Other significant price-related factors?
- Did the prime obtain adequate price competition?
- How does the quoted price compare with other prices?

## **ANALYZING HISTORICAL PRICES P. 7-33**

- Were historical prices reasonable?
- Have specifications changed?
- Has purchasing environment changed?
- Is the item still in production?
- Is prime still factoring in a nonrecurring cost?
- Have there been changes in economic conditions?

## **ANALYZING INVENTORY PRICING P. 7-35**

- First-In-First-Out (FIFO)
- Last-In-First-Out (LIFO)
- Weighted Average
- Moving Average
- Standard Cost

## **UNITS IN INVENTORY**

---

**P. 7-35**

- UNIT A @ \$100
- UNIT B @ \$110
- UNIT C @ \$105
- UNIT D @ \$115
- UNIT E @ \$120

## **SUBCONTRACT PRICING RESPONSIBILITIESP. 7-41**

- **CONTRACTING OFFICER**
  - **Assure that overall price is fair and reasonable**
- **PRIME OR HIGHER TIER SUBCONTRACTOR**
  - **Perform price analysis**
  - **Perform cost analysis when necessary**
  - **Provide subcontractor data when required**
  - **Obtain subcontractor data when required**

## **DIRECT MATERIAL SUMMARY TABLE**

**P. 7-46**

<b>MATERIAL COST</b>	<b>Proposal</b>	<b>Audit</b>	<b>Tech. Report</b>	<b>ACO Report</b>	<b>YOUR OBJECTIVE</b>
<b>Purchased Parts</b>	\$1,100,000	\$1,099,000	\$1,100,000	\$1,100,000	
<b>Sooper Antenna</b>	\$825,000	\$825,000	\$747,500	\$747,500	
<b>Scrap &amp; Usage</b>	\$57,750	\$57,720	\$55,425	\$55,425	

# **DIRECT LABOR COST ANALYSIS    P. 8-3**

1. Question Direct Labor Mix
2. Question Labor Hour Estimates
3. Question Wage Rates

# **ANALYZE DIRECT LABOR MIX**

---

**P. 8-5**

- Identify classifications of direct labor
- Identify major types of direct labor
- Analyze direct labor mix

# **IDENTIFY CLASSIFICATIONS OF DIRECT LABOR**

---

**P. 8-6**

- Position
- Class Of Positions
- Position Classification Plan

## **IDENTIFY MAJOR TYPES OF LABOR**

**P. 8-8**

- Engineering Labor
- Manufacturing Labor
- Services Labor

## **ANALYZE DIRECT LABOR MIX**

**P. 8-11**

- Determine whether a more efficient and economical skill mix is possible
- Determine if proposed labor should be indirect
- Determine realism of proposed skill mix
- Document concerns in prenegotiation positions

- How complex is the contract effort?
- How many labor hours are available?
- What is **your** professional **judgement**?

- Work methods identical?
- Historical costs represent efficient use of labor?
- Historical costs include the cost of changes?
- Make-or-Buy plan the same?
- Any labor functions doublecounted?

(continued next slide)

- Historical data complete?
- Historical data any good?
- Are historical data skewed by incidents of uneconomical or inefficient performance?
- Has the production environment changed?
- Adjustment factor reasonable?

- Is there a relationship?
- Will cost-to-cost trends continue?
- CER used consistently?
- CER accurate?
- CER current?

(continued next slide)

- Is there a better CER?
- CER self-fulfilling prophecy?
- CER as accurate as standards or actuals?

## **IMPROVEMENT CURVE ANALYSIS P. 8-26**

- Significant manual labor?
- Will work proceed without interruption?
- Are the tasks complex?
- Major technological changes expected?
- Management pressure to improve?

# **ANALYZING IMPROVEMENT CURVE ESTIMATES**

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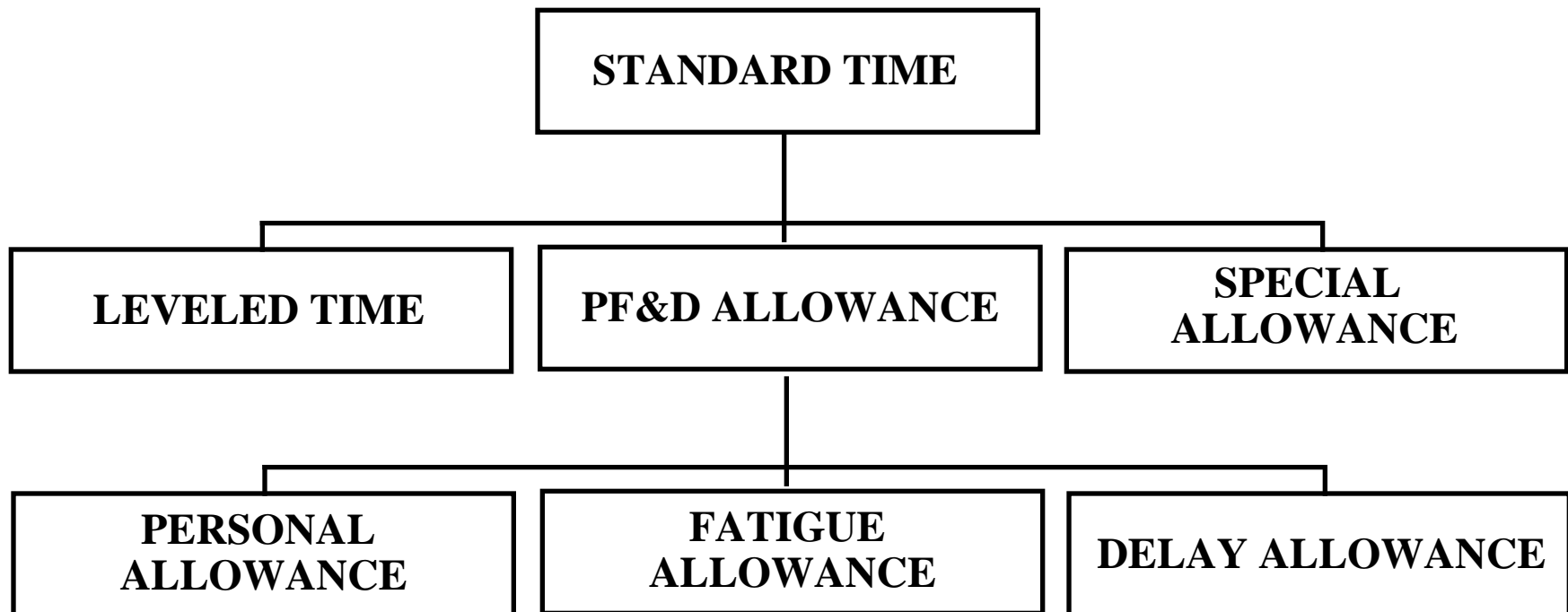
**P. 8-28**

- Does improvement curve theory apply?
- Adequate documentation?
- Properly applied to available data?
- Costs of changes and interruptions isolated?
- Continued improvement projected?
- Rework and repair properly considered?

# **STANDARD TIME**

**P. 8-31**

“The time necessary for a qualified worker, working at a normal pace, under capable supervision, with normal fatigue and delays, to perform a defined task”



The time that a worker of average skill, making an average effort under average conditions, would take to complete a required task, as determined by:

- Time Study
- Predetermined Level Times
- Standard Time Data
- Work Sampling

## **REALIZATION vs. EFFICIENCY FACTOR P. 8-34**

$$\text{Realization Factor} = \frac{\text{Total Actual Hours}}{\text{Standard Hours}}$$

$$\text{Efficiency Factor} = \frac{\text{Standard Hours}}{\text{Actual Hours}} * 100$$

## **ANALYSIS OF STANDARDS ESTIMATES P. 8-36**

- Did the contractor use available standards?
- Standards properly developed?
- Realization / efficiency factors relevant?
- Realization / efficiency factors current?
- Effective variance controls?
- Rework and repair properly considered?

## **FACTORS AFFECTING WAGE RATES**

**P. 8-40**

- Geographical Location
- Skill Levels
- Time Period Of The Contract
- Conditions In Contractor's Work Force

- Service Contract Act
- Davis Bacon Act
- Walsh-Healey Public Contract Act

## **WEIGHTED AVERAGE LABOR RATE     P. 8-44**

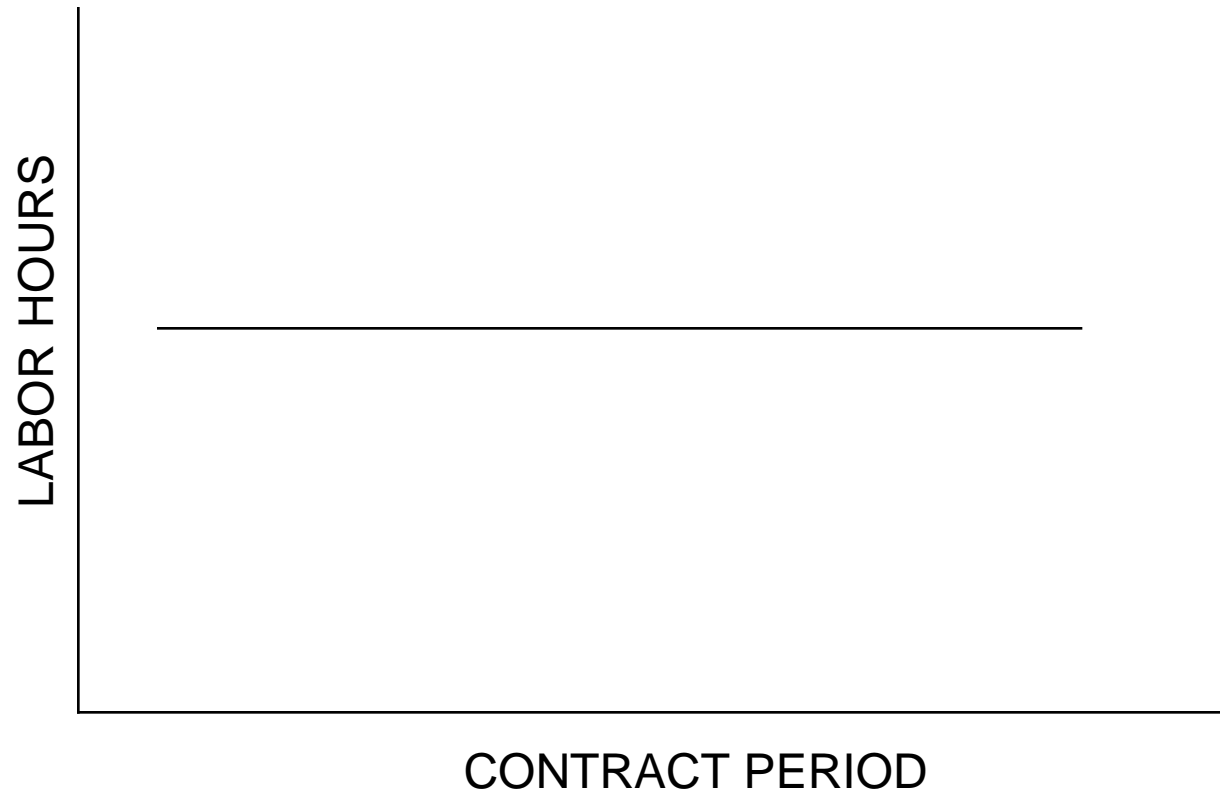
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<b>ENGINEERING LABOR CATEGORY</b>	<b>ENGINEERS EMPLOYED</b>	<b>WAGE RATE PER HOUR (\$)</b>	<b>WEIGHTED AVERAGE RATE</b>
Senior	100	\$37.50	\$3,750
Intermediate	200	\$31.00	\$6,200
Entry-Level	300	\$29.95	\$8,985
Total Work Force	600		
Total of Wage Rates		\$98.45	
Total of Work Force X Rate			\$18,935

# CONTRACT LABOR HOURS

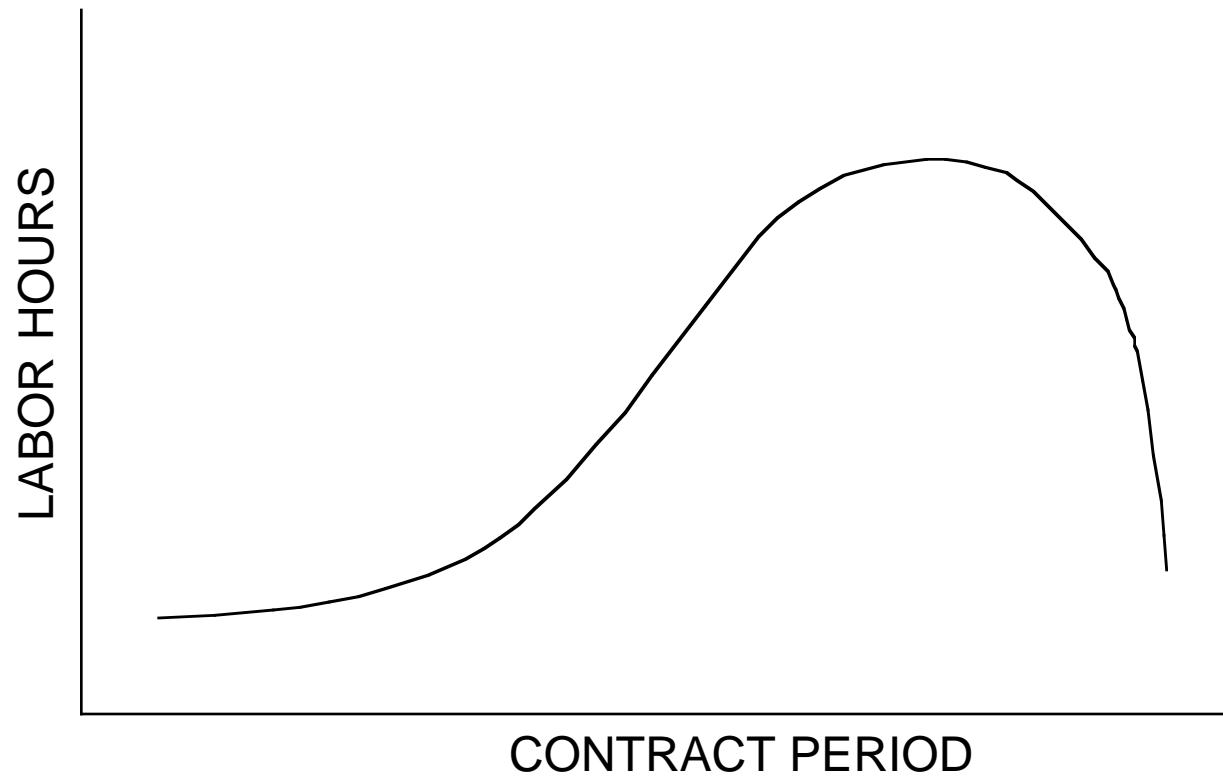
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P. 8-48



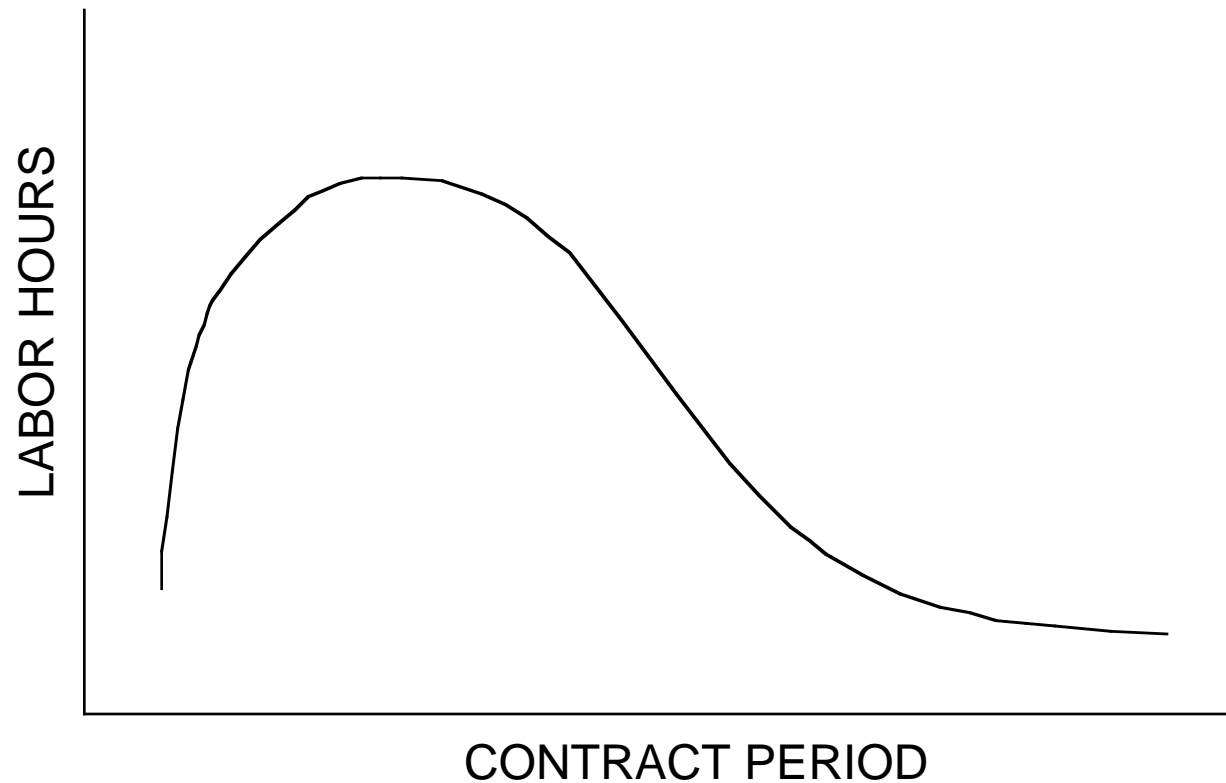
# CONTRACT LABOR HOURS

P. 8-48



# CONTRACT LABOR HOURS

P. 8-48



# **DIRECT LABOR SUMMARY TABLE P. 8-55**

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<b>LABOR COST</b>	<b>PROP.</b>	<b>AUDIT</b>	<b>TECH. REPORT</b>	<b>ACO REPORT</b>	<b>YOUR OBJECTIVE</b>	<b>YOUR RATIONALE</b>
<b>Mfg Hours 19X8</b>	<b>24,500</b>	<b>24,500</b>	<b>23,030</b>	<b>23,030</b>		
<b>Mfg Hours 19X9</b>	<b>25,500</b>	<b>25,500</b>	<b>23,970</b>	<b>23,970</b>		
<b>Mfg Wage Rate 19X8</b>	<b>\$10.00</b>	<b>\$9.80</b>	<b>N/A</b>	<b>\$9.40</b>		
<b>Mfg Wage Rate 19X9</b>	<b>\$10.00</b>	<b>\$10.20</b>	<b>N/A</b>	<b>\$10.11</b>		
<b>Eng Hours 19X8</b>	<b>2,817.5</b>	<b>2,818</b>	<b>0</b>	<b>0</b>		
<b>Eng Hours 19X9</b>	<b>2,932.5</b>	<b>2,932</b>	<b>3,290</b>	<b>3,290</b>		
<b>Eng wage Rate 19X8</b>	<b>\$19.76</b>	<b>\$18.68</b>	<b>N/A</b>	<b>\$18.65</b>		
<b>Eng Wage Rate 19X9</b>	<b>\$19.76</b>	<b>\$19.80</b>	<b>N/A</b>	<b>\$20.10</b>		

## **OTHER DIRECT COSTS**

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**P. 9-4**

- Travel
- Consultants And Contract Labor
- Preproduction Cost
- Special Tooling And Test Equipment
- Computer Time
- Federal Exercise Tax
- Royalties

# **SPECIAL ESTIMATING CONCERNS**

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**P. 9-26 – 9-27**

- Selection of cost proposed as ODC?
- Potential duplication of effort?
- Misapplication of rates and factors?

# **INDIRECT COST ANALYSIS**

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**P. 10-3**

- Importance And Composition
- Indirect Cost Rates
- Indirect Cost Allocation Cycle

# INDIRECT COSTS

P. 10-5

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- Costs that **cannot** practically be assigned directly to the production or sale of a particular product
- Direct costs of minor dollar amount

# **DIRECT / INDIRECT DECISION      P. 10-9**

- Contractor's Decision
- Audit Review Guidelines
  - FAR
  - GAAP
  - CAS
  - Official interpretations and precedents

# **INDIRECT RATE FORMULA**

**P. 10-11**

---

$$\frac{\text{Indirect Cost Pool}}{\text{Base}} = \text{Rate}$$

A logical grouping of indirect costs with a similar relationship to cost objectives.

Examples:

- Material Overhead
- Manufacturing Overhead
- Engineering Overhead
- General And Administrative (G&A)

Some measure of direct contractor effort that can be used to allocate pool costs on the basis of benefits accrued by the several cost objectives.

Examples:

- Direct Labor Hours
- Direct Labor Dollars
- Number Of Units Produced
- Machine Hours

# **STEPS IN ESTIMATING INDIRECT COSTS**

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**P. 10-18**

1. Estimate Volume
2. Estimate Bases
3. Estimate Pools
4. Calculate Indirect Cost Rates
5. Apply Indirect Cost Rates

# ESTIMATE RATE

P. 10-22

	YEAR #1		YEAR #2	
	MFG O/H	G&A	MFG O/H	G&A
POOL \$	\$30,000,000	13,040,000	40,000,000	16,500,000
BASE \$	\$10,000,000	80,000,000	15,000,000	115,000,000
RATE %	300%	16.3%	266.7	14.3%

**MFG O/H = MFG O/H Dollars ÷ \$ Direct Labor Dollars**

**G&A = G&A Expense Dollars ÷ Total Production Cost**

***(Total Production Cost = Direct Labor Dollars + Indirect Dollars + Direct Material Dollars)***

## **APPLY RATES TO CONTRACTS    P. 10-23**

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<b>COST ELEMENT</b>	<b>PROPOSED/APPLIED</b>
Material Dollars	\$100,000
Direct Labor Dollars @ \$25.00/hr	\$25,000
MFG Overhead @ <b>300%</b>	\$75,000
Total Production Cost (TPC)	\$200,000
G&A @ <b>16.3% TPC</b>	\$32,600
<b>Total Cost</b>	<b>\$232,600</b>

## **INDIRECT COST ALLOCATION CYCLE P. 10-25**

- Forward Pricing
- Cost Incurrence
- Cost Allocation

## **FORWARD PRICING RATE AGREEMENT P. 10-26**

- Formal bilateral agreement
  - Contractor proposal
  - Government acceptance
- Circumstances for overturning

## **NEGOTIATED VS. ACTUAL COSTS**

**P. 10-28**

<b>COST ELEMENT</b>	<b>NEGOTIATED</b>	<b>INCURRED</b>
<b>Material Dollars</b>	<b>\$100,000</b>	<b>\$100,000</b>
<b>Direct Labor Dollars</b>	<b>\$25,000</b>	<b>\$25,000</b>
<b>MFG Overhead</b>	<b>@ 300% \$75,000</b>	<b>@ 260% \$65,000</b>
<b>TPC</b>	<b>\$200,000</b>	<b>\$190,000</b>
<b>G&amp;A</b>	<b>@ 16.3% \$32,600</b>	<b>@ 17.4% \$33,060</b>
<b>Total Cost</b>	<b>\$232,600</b>	<b>\$223,060</b>
<b>Profit @ 10%</b>	<b>\$23,260</b>	<b>\$32,800</b>
<b>Total Price</b>	<b>\$255,860</b>	<b>\$255,860</b>

Cost Analysis 10-12

# **ANALYSIS OF PROPOSED FORWARD PRICING RATES**

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**P. 10-38**

- Identify unallowable costs
- Analyze base estimate
- Analyze base / pool relationship
- Analyze changes in base and pool
- Consider projection accuracy
- Integrate results

# **ANALYZE BASE ESTIMATE**

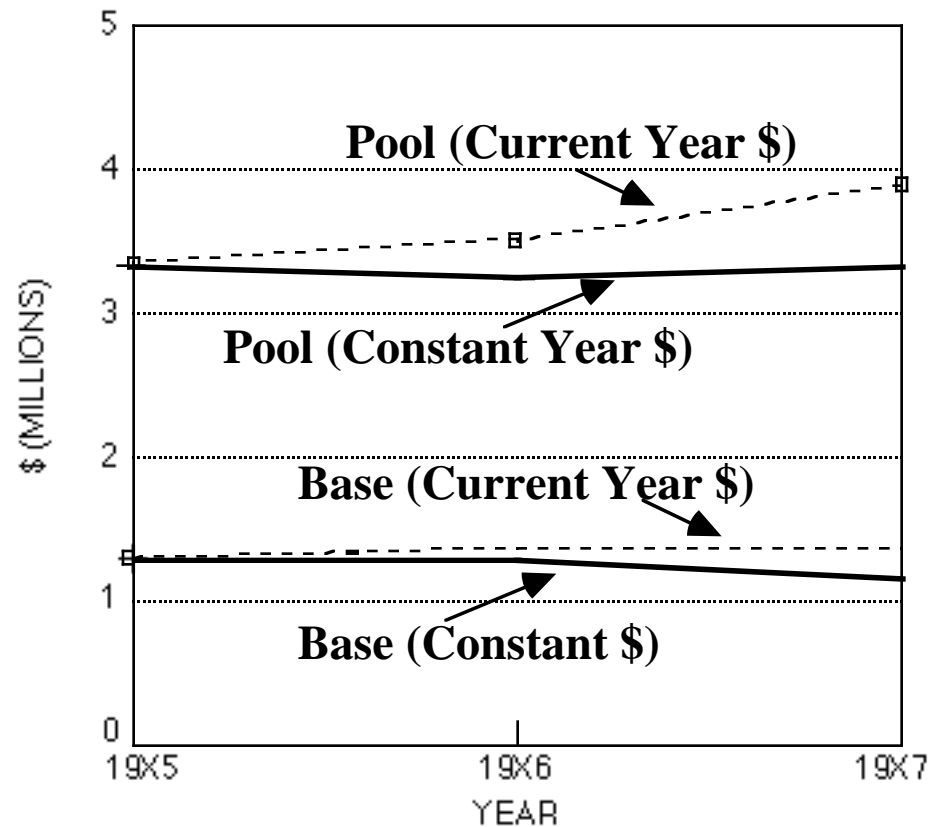
**P. 10-39**

- Correct base period used?
- Are costs included in the base?
- Will the base fairly allocate costs?
- When was the estimate made?
- What information was considered? (Any significant data **not** considered?)
- How stable has the base been?

## **ANALYZE BASE/POOL RELATIONSHIP P. 10-42**

- Composition of the pool changed?
- Has the rate structure changed?
- Rate changes consistent with pool characteristics?

# **ANALYZE BASE/POOL CHANGES P. 10-45**



# CONSIDER PROJECTION ACCURACY

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**P. 10-46**

Year of Estimate	Projected Year	Proposed Rate	Actual/ Current Rate	Percentage Point Difference
19X5	19X6	259.1%	254.8%	4.3
19X4	19X5	256.3%	251.8%	4.5
19X3	19X4	260.0%	254.8%	5.2

On the average, the offeror overestimates indirect rates by 4.67 percentage points.

# INDIRECT RATE COMPARISON P. 10-50

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<b>RATE &amp; YEAR</b>	<b>PROPOSED</b>	<b>AUDIT</b>	<b>FPRA</b>
Material - 19X8	2.1%	2.1%	2.1%
Material - 19X9	2.1%	2.1%	2.0%
Engineering - 19X8	84.0%	73.5%	74.2%
Engineering - 19X9	84.0%	71.8%	72.5%
Manufacturing - 19X8	200.0%	169.8%	169.8%
Manufacturing - 19X9	200.0%	165.6%	166.4%
G&A - 19X8	5.1%	5.5%	5.6%
G&A - 19X9	5.1%	5.3%	5.4%

# PROFIT CONSIDERATION

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P. 11-7

Cost of money values **cannot** be used as a profit base

# **CALCULATING COST OF MONEY P. 11-18**

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<b>COST OF \$ CALCULATIONS</b>	<b>BASE</b>	<b>COST OF \$ FACTORS*</b>	<b>COST OF MONEY</b>
Engineering Direct Labor	\$9,512.50	* .30000 =	\$2,853.75
Manufacturing Direct Labor	\$2,728.25	* .26667 =	727.54
Technical Computer	75 hrs	* \$17.77780 =	1,333.34
General & Administrative	\$339,007.03	* .00133 =	450.88
<b>Total Cost of Money</b>			<b>\$5,365.51</b>

\* From Column 7 of table on page 11-10

## **APPLYING FACTORS     P. 11-17 and 11-18**

---

<b>COST ELEMENT</b>	<b>COST</b>
<b>Total Less Cost of Money</b>	<b>\$389,858.08</b>
<b>Profit (15% Total Less Cost of Money)</b>	<b>\$58,478.71</b>
<b>Cost of Money</b>	<b>5,365.51</b>
<b>GRAND TOTAL</b>	<b>\$453,702.30</b>

# **PROFIT ANALYSIS GOALS**

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**P. 12-6**

- Stimulate efficient performance
- Attract best capabilities
- Maintain viable industrial base

- Negotiations aimed solely at reducing profit / fee
- Negotiation of extremely low profit / fee
- Use of historical rates without considering contract effort
- Use of predetermined rates without considering contract effort

# FEE CEILING

P. 12-6

TYPE OF CONTRACT	STATUTORY FEE LIMIT
Experimental, developmental, or research work performed under a cost-plus-fixed-fee contract	15% of estimated contract cost
All other cost-plus-fixed-fee contracts	10% of estimated contract cost

# **OTHER CONSIDERATIONS**

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**P. 12-8**

- Exclude facilities capital cost of money
- Changes to existing contracts — USE:
  - Basic contract rate
  - OR
  - New rate based on current effort

CONTRACTOR EFFORT				
COST CATEGORY	GOV'T COST OBJECTIVE (a)	WEIGHT RANGE (b)	ASSIGNED WEIGHT (c)	WEIGHTED PROFIT / FEE
Material Acquisition	\$	1% to 4%	%	\$ (a) X (c)
Direct Labor	\$	4% to 12%	%	\$ (a) X (c)
Overhead	\$	3% to 8%	%	\$ (a) X (c)
Other Costs	\$	1% to 3%	%	\$ (a) X (c)
G&A	\$	4% to 8%	%	\$ (a) X (c)
<b>TOTAL</b>	\$			\$ Σ

OTHER FACTORS				
Factor	Measure- ment Base (a)	Weight Range (b)	Assigned Weight (c)	Weighted Profit / Fee
Cost Risk	TOTAL  GOV'T  COST  OBJECTIV E	0% to 7%	%	\$ (a) X (c)
Investment		-2% to +2%	%	\$(a) X (c)
Performance		-1% to +1%	%	\$(a) X (c)
Socioeconomic Programs		-0.5% to +0.5%	%	\$(a) X (c)
Special Situations		Unspecified	%	\$(a) X (c)
<b>TOTAL OTHER FACTORS</b>				\$ Σ

## Contractor Effort

1. Cost Category	Gov't Cost Objective (a)	Weight Range (b)	Assigned Weight (c)	Weighted Profit/Fee (d)
1A. Total	\$			\$ X

## OTHER FACTORS

FACTOR	Measure-ment Base (a)	Weight Range (b)	Assigned Weight (c)	Weighted Profit/Fee (d)
2A. Total Other Factors				\$Y
3.	Subtotal Profit/Fee Lines (1.A) + (2.A)			\$X + Y
4.	Less Facilities Cost Of Capital			-\$ F
5.	Total Profit/Fee Objective Line (3) - (4)			\$X+Y-F

# PROFIT / FEE RATIONALE

P. 12-38

Cost Category	Rationale For Assigned Weight
Material Acquisition	
Direct Labor	
Overhead	
Other Costs	
General Management	
Cost Risk	
Investment	
Performance	
Socio-Economic Programs	
Special Situations	

Cost Analysis 12-8

# **PREPARING FOR NEGOTIATIONS P. 13-3**

- Trade-Off Analysis
- Contract Type And Prenegotiation Objectives
- Documentation Rationale And Factual Support

- Perform overall price analysis
- Involve negotiation team in trade-off analysis
- Cost drivers
- Cost risk

## MAJOR FIXED-PRICE CONTRACT TYPESP. 13-13

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CONTRACT TYPE	PRICE-RELATED OBJECTIVES
Firm Fixed-Price	Total Price
Fixed-Price Economic Price Adjustment (FP-EPA)	Fixed-Price Basis For Adjustment Limits Of Adjustment
Fixed-Price Incentive Firm (FPIF)	Target Cost Target Profit Cost-Sharing Arrangement Ceiling Price

# MAJOR COST CONTRACT TYPES

P. 13-14

CONTRACT TYPE	PRICE-RELATED OBJECTIVES
Cost-Plus-Incentive-Fee	Target Cost Target Fee Cost-Sharing Arrangement Minimum Fee Maximum Fee
Cost-Plus-Award-Fee	Estimated Cost Base Fee Award Fee
Cost-Plus-Fixed-Fee	Estimated Cost Fixed Fee

Cost Analysis 13-4

# OTHER CONTRACT TYPES

P. 13-19

CONTRACT TYPE	PRICE-RELATED OBJECTIVES
Time-And-Materials	Labor-Hour Price Material Handling Cost Ceiling Price
Labor-Hour	Labor-Hour Price Ceiling Price

# **DOCUMENT RATIONALE AND FACTUAL SUPPORT**

## **P. 13-21 – 13-24**

---

- Procurement situation
- Contractor estimating rationale
- Analysis and differences with rationale
- Negotiation positions
- References

# **PRICE PRENEGOTIATION MEMORANDUM P. 13-25**

- Subject Line
- Memorandum Text
  - Introductory Summary
  - Particulars
  - Procurement Situation
  - Prenegotiation Summary
  - Miscellaneous

# **PRENEGOTIATION SUMMARY**

---

**P. 13-30**

COST ELEMENT	PROPOSED	OBJECTIVE	DIFFERENCE
MANUFACTURING			

# **COST REALISM ANALYSIS**

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**P. 14-4**

Determine whether the proposed costs realistically reflect the effort to accomplish the needed work and to estimate the most probable cost.